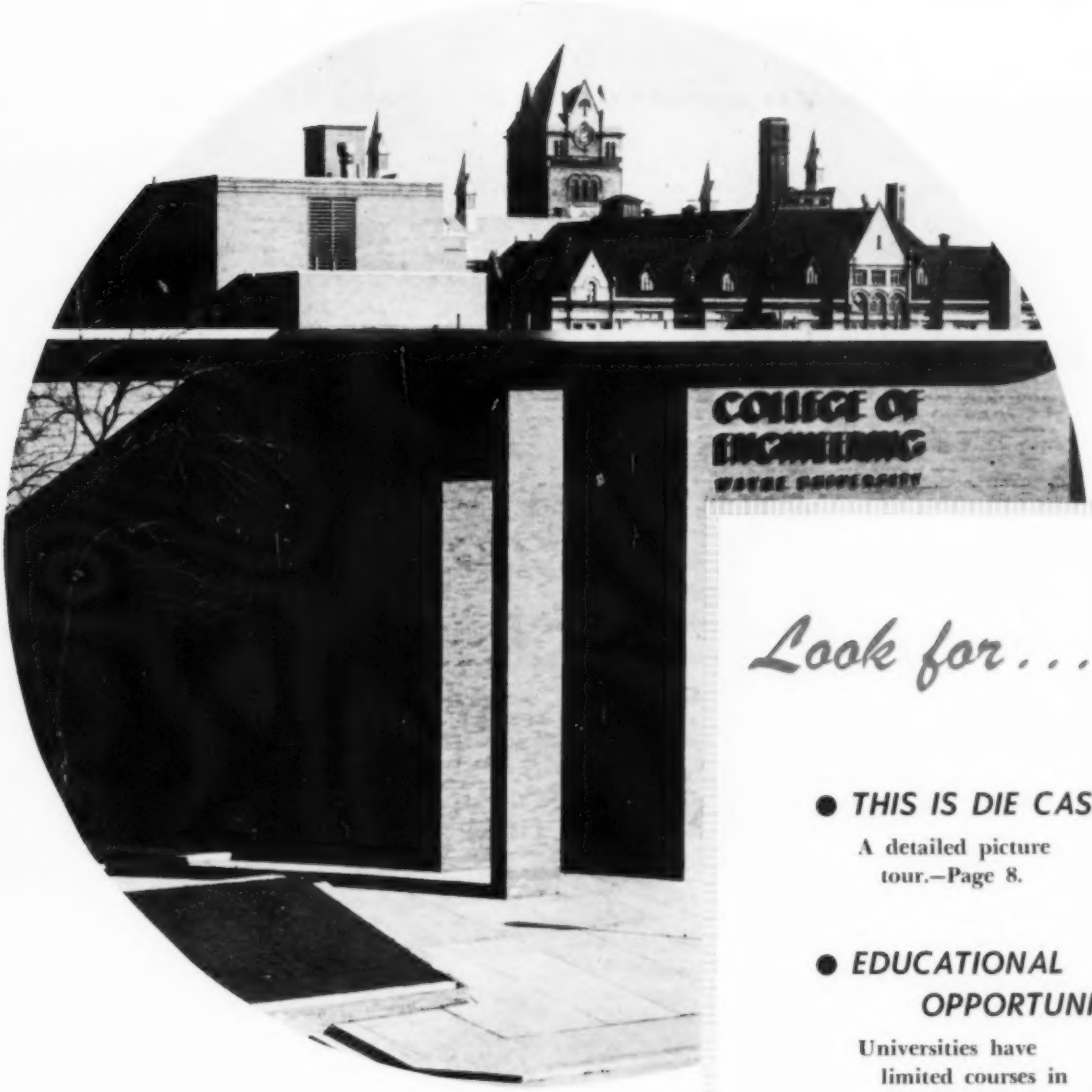
DIE CASTING ENGINEER

THE SOCIETY OF DIE CASTING ENGINEERS, INC.
19382 JAMES COUZENS HIGHWAY
DETROIT 35, MICH.

EDUCATION

September 1957



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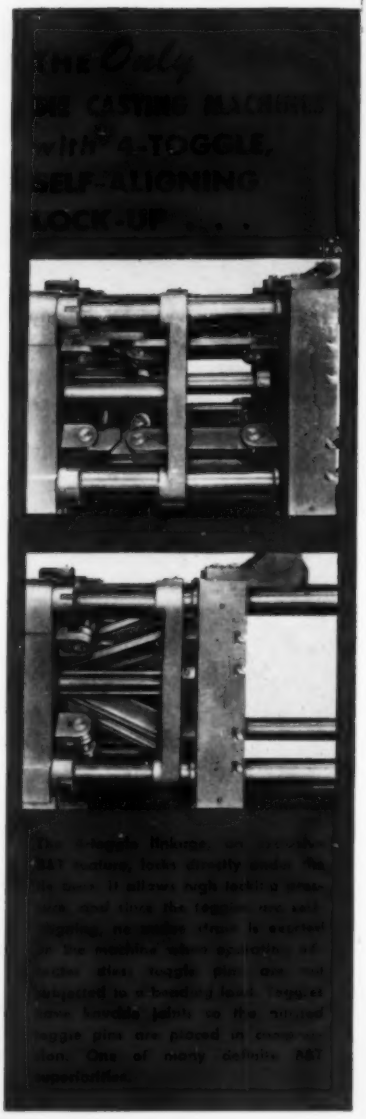
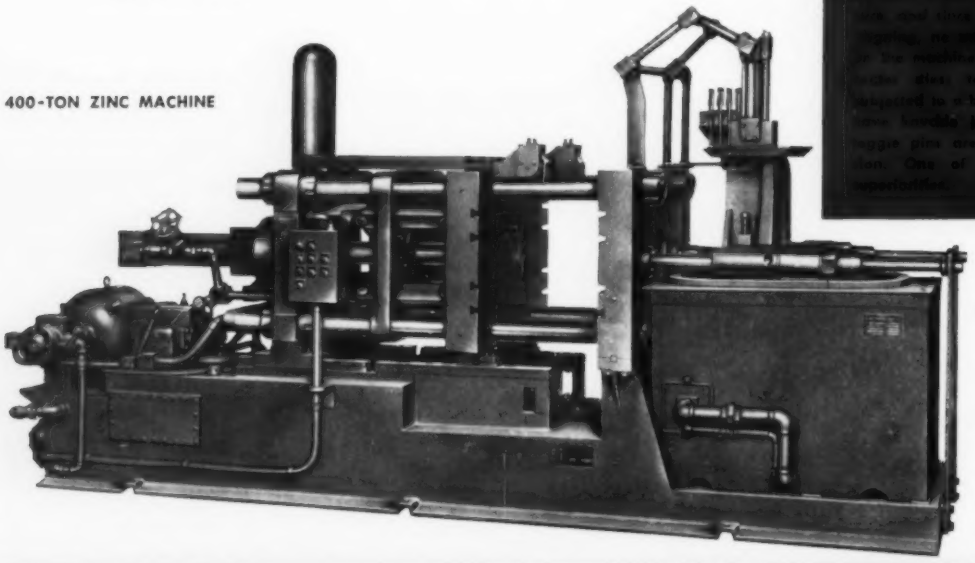


400-TON ZINC MACHINE



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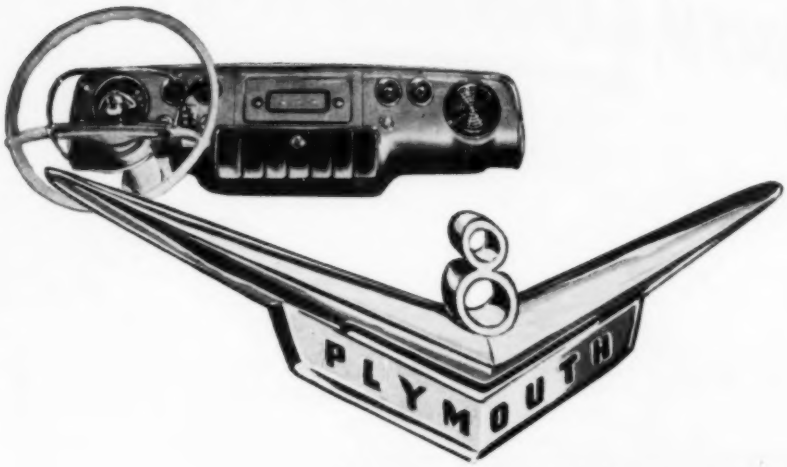

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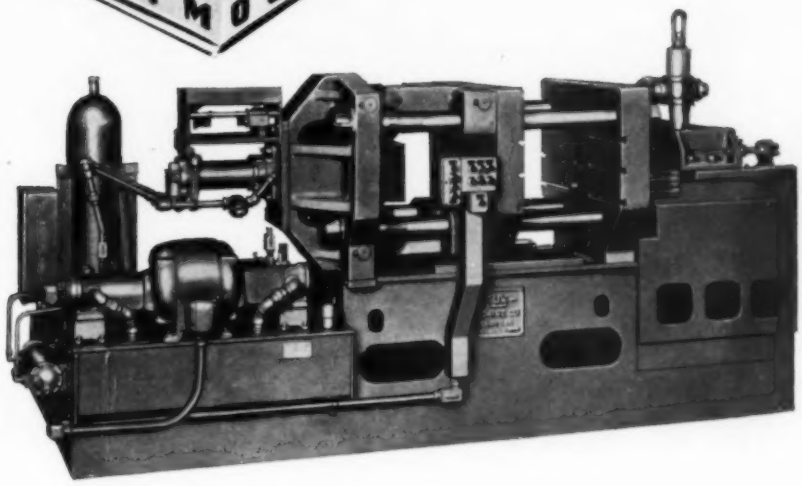

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Hydraulically operated goose neck plunger type die casting machine for production of zinc, lead or tin castings.

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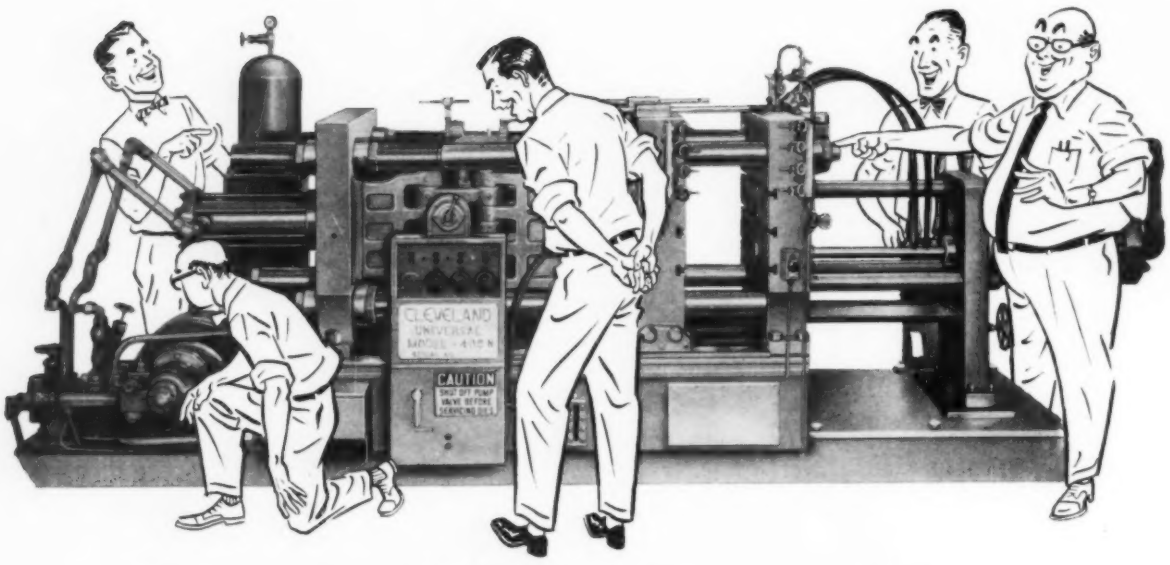
WELL WORTH LOOKING INTO!

Cleveland Model 400-N shown with cold chamber end. Weight of metal per shot, including gate: 7.2 lbs., aluminum; 14.5 lbs., zinc.



New CLEVELAND model 400-N

Hydraulic Universal Die Casting Machine

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From every angle, the new Cleveland Model 400-N has every feature you're looking for to give you better castings, faster, at less cost!

Here is a massively constructed, rugged, powerful machine. It locks dies at better than 400 tons pressure, *strain gauge tested*. Its faster die closing and opening speed will give you more shots per hour. Its rapid injection speed guarantees production of sound, dense, hardware-finish castings. Further, Cleveland's time-tested design and quality construction assure dependable, around-the-clock operation with machine maintenance at a minimum level.

Look into the new Cleveland Model 400-N, from every angle. You'll quickly discover why leading die casters call it the outstanding machine buy in its capacity range. Call in a Cleveland sales engineer for complete information and send for the new Model 400-N Bulletin.

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VOLUME 1
NUMBER 3
SEPTEMBER, 1957

DIE CASTING ENGINEER

Official Publication of
THE SOCIETY OF DIE CASTING ENGINEERS, INC.

STAFF

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DEPARTMENTS

The DIE CASTING ENGINEER is published quarterly by The Society of Die Casting Engineers, Inc.—a society for the improvement and dissemination of the knowledge of the arts and sciences of die casting, the finishing of metals, and the allied arts. The DIE CASTING ENGINEER offers a concentrated coverage of management and engineering in the die casting and directly related industries.

Only advertising pertaining to die casting and finishing of metals and the allied arts is acceptable. The Society reserves the right to reject any advertising deemed objectionable for any reason what-so-ever.

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— UNiversity 4-9116 —

Parting Line

PAT FROM PUBLISHER

Gentlemen:

I have enjoyed looking over the copy of the June issue of *Die Casting Engineer* which you left for me.

It is apparent that you folks are well under way with this operation and should be able to carve your place in the field without difficulty.

The layout and design of the magazine in general looks very attractive, it appears to be quite a readable publication.

I know that you will have excellent success with it, and I wish you the best of luck.

Drop in and see us at any time.

Cordially,
Allan Ray Putnam
Assistant Executive Secretary
American Society of
Tool Engineers

This comment from the Publisher of a fine publication such as the TOOL ENGINEER is deeply appreciated.—**Ed.**

FROM ENGLAND

Dear Sirs:

We were extremely pleased to receive two specimen copies of your Journal and I am arranging to have a subscription taken out through our Agents, B. H. Blackwell of Oxford.

Yours sincerely,
Stella V. Keenan, Librarian
Zinc Development Association
34 Berkeley Square
London W.1

It's interesting to know that "missionary work" is appreciated by our friends overseas. Die Casting knows no national boundary limits.—**Ed.**

We take you on a tour of the Congress Die Casting Division, Tann Corporation, of Detroit, one of Michigan's largest die casting companies. This should prove to be a handy guide for explaining the die casting process to new men in your company and to your clients not directly related to the Die Casting Industry.

THIS IS DIE CASTING

THE COMPLETE STORY OF DIE CASTING — IN PICTURES

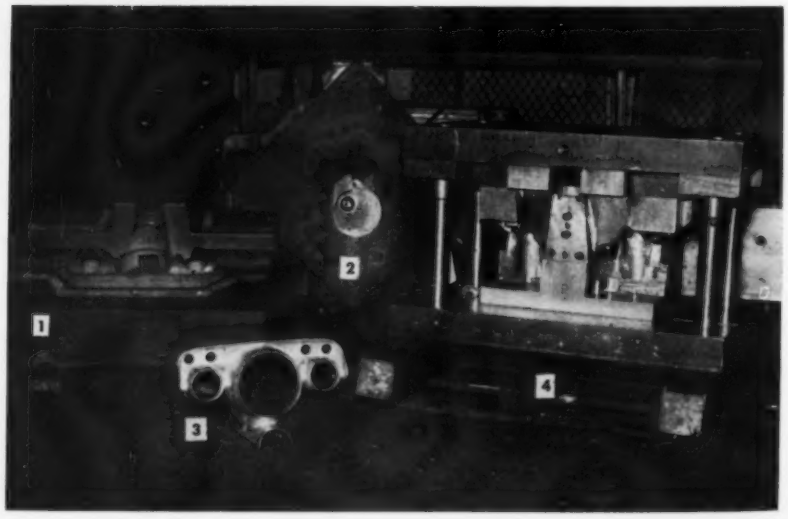
by John R. Zurbrick
Editor-in-Chief

DIE CASTING is the most widely used of any of the permanent-mold processes. High production rates, low metal costs, few finishing operations, and close dimensional tolerances have contributed greatly to this reputation.

To set the record straight, Die Casting is the process of making a casting by forcing molten metal *under pressure* into a metal die cavity. The fact that the metal is under a very high applied pressure during solidification sets this process apart from most of the other molding processes. These pressures usually run up to 35,000 psi, depending on the metal and application. Owing to the fact that the dies used are machined from specially-alloyed steels, the melting temperatures of the casting metals are considerably lower than that of the steels. Thus, the metals that may be successfully die cast are limited to alloys of zinc, aluminum, copper, magnesium, lead, and tin. Zinc still leads in commercial tonnage, but aluminum and magnesium are so rapidly increasing in demand for die castings, that even this may soon be challenged.

Congress Die Casting Division of the Tann Corporation is a typical die caster. The operations pictured and mentioned here cover practically all the operations found in every die casting plant across the country.

ENGINEERING and DIE DESIGN . . . At these tables every detail —casting position, parting line location, draft angles, ejection pin location, gating system, and more were planned out and drawn up for the die builder. All the initially anticipated production problems are incorporated into the design.



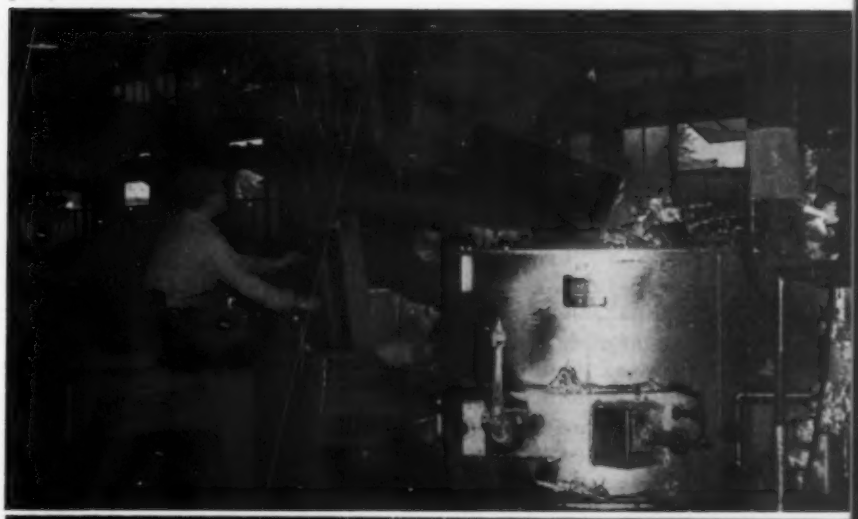
DIE BUILDING . . . Since Congress does not build its own dies, the work in this case was sent out to a local die maker. There, the wooden die pattern (1) was carefully hand-made and the rough steel sand casting made. The die maker then meticulously finished the steel casting into the required zinc die casting die (2). Both the ejector half and the cover half are shown together, the shot hole being foremost. If all goes well, this die as it came from the manufacturer will produce the zinc alloy die casting (3). To shear off the excess flash, gate, and runners, a set of trim dies (4) was also built locally.

DIE CASTING ALLOYS . . . Stacked here are tons of slab primary zinc. This metal was shipped directly from the smelting plants to storage here. Primary refers to the condition of the metal, in this case being alloyed from metal taken directly from the ore and containing no scrap or remelt.

THE ALLOYING of casting metals for the die casting process is a compromise. Not only must the alloy give desirable properties to the finished die casting, but the liquid and solid alloy must perform well during the die casting operation. All too often good finished properties are accompanied by poor casting properties, or vice-versa.

Over 70% of all die castings produced are of some zinc base alloy. These alloys cast easily, giving a good finish and considerable strength with a fairly low melting temperature and at low cost. The alloying agents used are aluminum, copper, and magnesium.

An ever increasing number of die castings are cast in aluminum base alloys due to their strength, light weight, and corrosion resistance. The alloying agents usually found in aluminum are silicon, copper, nickel, iron, and magnesium. Magnesium, favored for its light weight, is alloyed principally with aluminum.

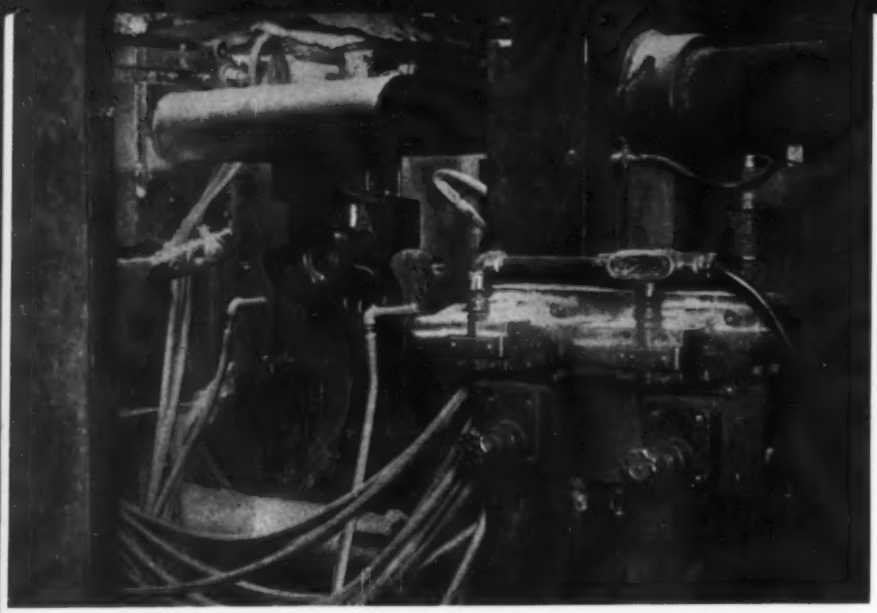


MELTING and HOLDING . . . The bottom-fired gas furnace melts down the zinc and holds the liquid metal ready-for-use in the hot chamber die casting machines. When needed, the metal is drawn into ladles from the center of the hot melt and well below its surface. Such a procedure reduces contamination of the metal with its oxide.

Zinc scrap from the trim presses is being added to the melt.

SETTING THE DIE . . . The die is being lowered into position. The clamps are then tightened and the machine is adjusted for the height of the die.

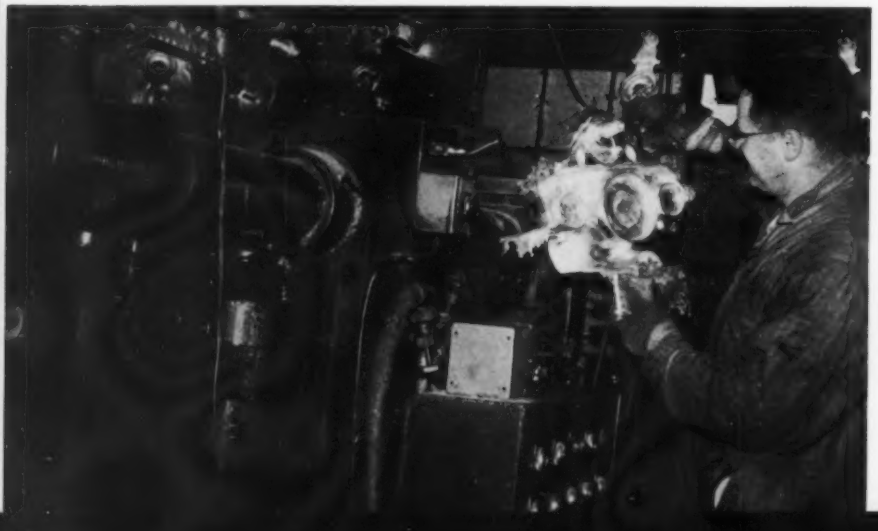
The trial-and-error of die casting now begins. The tedious work that follows includes fixing the proper die temperature, setting the cycle time, maintaining proper lubrication of the die surface, picking the best alloy, and finding the optimum die cooling. Other adjustments that must be set are metal temperature, injection pressure, and injection speed.



OPEN DIE PREPARATION . . . After the proper die and machine procedures have been determined, the unit is put into full production. When the die is open it is inspected for flash and soldering and is thoroughly lubricated.

MAKING THE SHOT . . . The hot liquid zinc, at about 800°F., is lifted by the piston into the shot end of the die. Tremendous pressure is applied to the piston, squeezing the metal into every corner and crevice of the die cavity. The first metal to reach the die is chilled and is washed through the cavity and into bobs. The air rushes from the cavity with metal following. Some metal is caught between the halves of the die and freezes, sealing the die cavity.

REMOVAL and INSPECTION, THE RAW CASTING . . . With the large amount of flash and the sprue at the top, the raw casting has little resemblance to the finished product. It must be inspected for any signs of porosity and chilling, or any other visible flaws. Since there is a definite cycle time assigned to this operation, the experience and speed of the operator will not affect the rate of production or, subsequently, the cost of the product.



DEPENDING ON THE METHOD of forcing the hot liquid metal into the die casting die, the overall die casting process is subdivided into the hot chamber process and the cold chamber process.

In the hot chamber process, the injection cylinder and gooseneck are built into the melting furnace and remain immersed in the liquid metal. Only metals which do not have an affinity for iron, that is, do not dissolve nor erode the submerged parts, may be used in this process. Zinc, tin, and lead alloys are recommended.

In applying the pressure to the molten metal, two methods are used —hydraulic pressure and air pressure. Hydraulic pressures may range up to 5000 psi and in some cases slightly higher. Air pressures may range from 80 to 600 psi. However, the air method is rapidly becoming obsolete.

Where hydraulic pressure forces the metal into the die, the gooseneck attached to the plunger cylinder remains connected to the die opening. During each cycle the cylinder fills with metal by gravity through inlet ports just below the plunger. The plunger stroke closes the ports and entraps a charge of metal, squirting it under high pressure into the die cavity.

The arrangement for applying air pressure to the charge of metal involves a movable gooseneck with air hose attached. During the casting cycle the gooseneck is immersed in the liquid metal for an interval of time just long enough to be filled through the forward end. The gooseneck is then lifted up and locked into position against the die opening. Air pressure is finally applied to complete the casting.

Hot chamber die casting machines at first were hand operated, however, today they are available with either semi-automatic or fully automatic operation, or both.

Because of their corrosive effects and the need for high pressures to give dense castings, the alloys of aluminum, magnesium, and copper require the cold chamber process. The range of pressures that may be

used are relatively unlimited as larger die casting machines are built. One of the largest machines in production today exerts a total force on the liquid metal of 617,000 pounds.

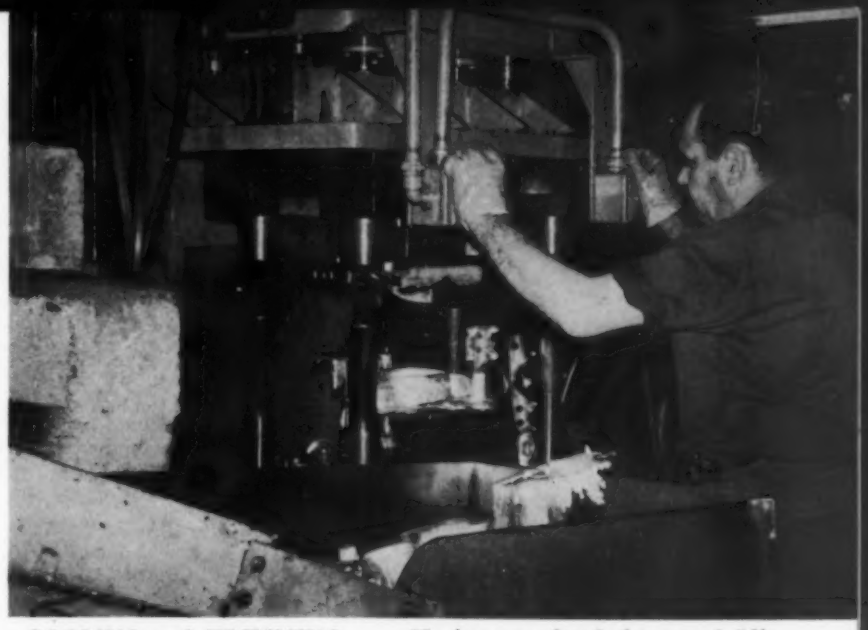
Essentially, the cold chamber process involves the hand ladling of the shot to the pressure cylinder or by a separate automatic furnace and ladling system. In the case of the hand ladled shot, the operator scoops out a volume of the melt in a small long-handled ladle. After he quickly transfers the shot to a funnel and hole in the top of the plunger tube, the ram comes forward, seals the shot hole and forces the metal into the die cavity under tremendous pressure. The automatic ladling system merely replaces the operator's duties in delivering a shot. Its closed system and submerged intake does, however, reduce contamination of the shot with metal oxides.

In both the hot and the cold chamber processes all of these operations take place at the "shot end" of the die casting machine adjacent to the stationary platen.

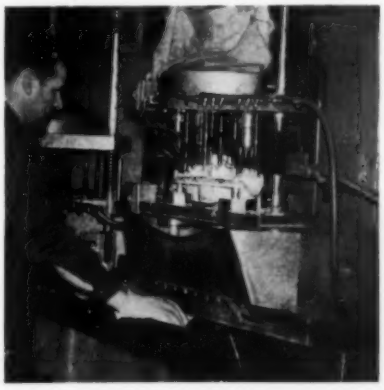
THE OTHER HALF of the die casting machine is concerned with opening and closing the die and ejection of the casting. Because of the tremendous pressures exerted in the die cavity which tend to force the die halves apart, the mechanism must not only close the die but must lock it together with greater force than that exerted by the ram, piston, or air pressure.

The actuating mechanism is the hydraulic cylinder which operates the movable platen. The die casting machine includes a hydraulic pump and motor to supply cylinder pressure. The movable platen rides back and forth on its supporting mechanism, being guided within the four heavy tie bars.

Heart of the die closing mechanism is the locking system. The most common locking system is some variation of the double hinge lock. As the platen slides forward the heavy hinge pins fall into a plane. Holding linkages are usually employed to exert an outward force against the hinges to hold them in a plane, thus completing the locking operation.

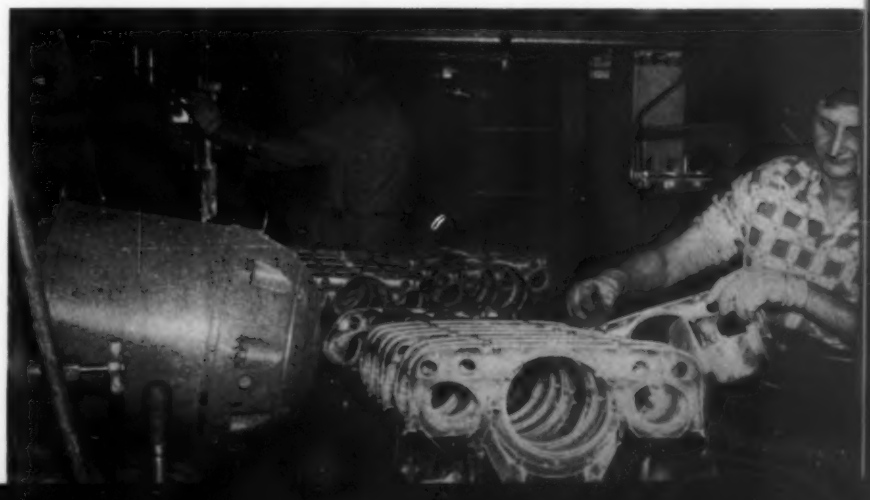


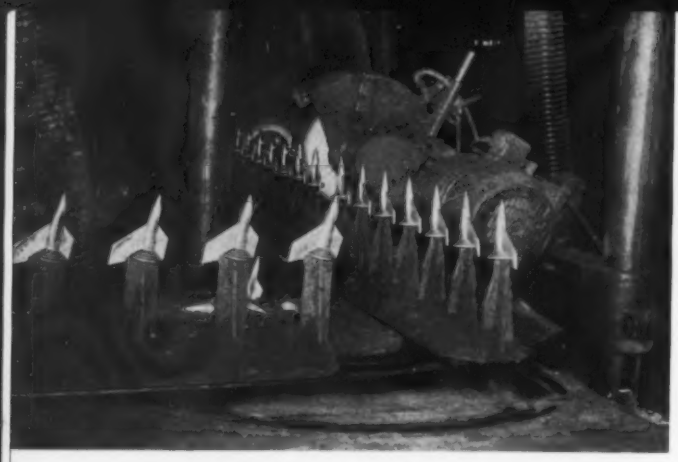
COOLING and TRIMMING . . . Having completed the actual "die casting" operation and having been satisfied in his visual inspection, the operator drops the casting into a tank of water for a quick cooling. After the next cycle he will place the casting on a conveyor headed for the trim press. The trim press merely removes all excess metal, leaving a clean casting.



DRILLING STUD HOLES . . . The usual method of mounting the finished product, in the place where it will be used, is with studs. A self-threading stud is fixed in the die casting and a nut is turned on the other end. The operation shown not only drills all the pilot holes in the stud bosses but simultaneously drills all other necessary holes. Each of the eleven drills is lowered at the proper rate and to the correct depth. Each is individually lubricated from the central system.

HOLE INSPECTION and STUD DRIVING . . . The drilled holes are checked for depth and alignment. Any error here would render the part useless at the time of assembly. The die casting as a whole is looked over for general appearance and visible flaws. In the background, studs are driven into the pilot holes quickly and automatically. The operator finally places the finished die casting on a tray headed for the paint booth and ovens.





THE BUFFING TABLE . . . Above, small ornament parts are buffed to a high luster in preparation for chromium plating. All surfaces required to be buffed are given a polishing in one complete revolution of the part around the table. Buffing compound is fed automatically to the whirling cloth buffs. Nine ornaments as a unit turn the corner at one time.

Below, ornaments are loaded on the right and removed from the left as the table conveyor rotates counter-clockwise. The overhead vacuum system removes spent buff cloth and buffing compound from the working area. Both the unbuffed and buffed die castings are crated much the same as eggs to keep them from picking up nicks and scratches.

DIES ARE SIMILAR for both the hot and the cold chamber processes since there is very little difference in the methods of holding and operating the dies. The dies are mounted on the movable and stationary platens with bolts and clamps fitted into T-slots or tapped mounting holes. The two halves of the die are aligned with heavy dowel pins usually mounted on the stationary half. When removable cores are required, they are mounted along with their operating mechanism at the edge of the main die and usually on the movable half.

The die not only contains the cavity and internal and external surfaces for the desired product, but also provides the shot hole which forms the "biscuit" of excess metal, the runners which carry the liquid metal to various parts of the main die cavity, the gates at the end of the runners, the vents through which the air in the cavity may leave, and the overflow bobs which collect initially chilled metal pushed from the die cavity.

A single-cavity die is used when the casting is fairly large or quite complicated. For relatively simple and small castings, a multiple-cavity die is recommended where all the units are connected with runners to a single shot hole. In some cases two or more different castings are die cast together in the same die. Such a die is known as combination die.

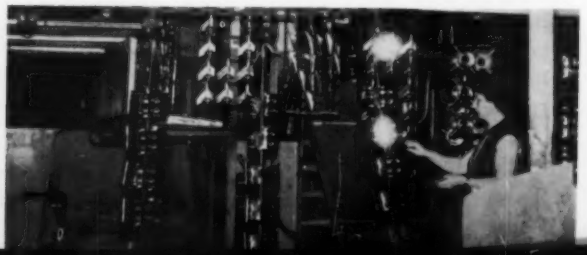
The operation of the die includes closing and locking, entry of liquid metal through the shot hole to fill the cavity, completion of freezing, removal of pressure, opening of the die, extraction of cores, and ejection of the hot die casting.

Ejection of the casting from the die is facilitated by a series of small pins mounted to an ejector plate set in the movable half of the die. A separate mechanism pushes the ejector plate and pins forward as the die opens to separate the casting from the die.

Die lubricants or coatings of some type must be applied to the die to protect it from erosion and checking and to keep the cast metal apart from the die surface for easy removal. Cooling water is circulated through both halves of the die to maintain the critical die temperature.

HANGING AND PLATING . . . Careful hanging of the parts to be plated is very important. As the ornaments are placed on the rack, they must make good electrical contact with the rack. From this location the racks of ornaments travel to the degreasing and washing tanks. All operations from this point until the ornaments are removed from the racks are fully automatic.

After cleaning, the electroplating process involves dipping the ornaments in a charged copper solution for a quick copper flash. The racks then travel a short distance to the nickel and chromium tanks where they wait in turn to be plated for the required period of time. The gleaming ornaments are then rinsed and dried for an inspection. These parts are ready for the consumer and are sent on to packaging.



PAINTING . . . Here our large die casting arrives at the paint department where it is transferred from the trays to special paint racks. Several operations are needed to put the soft, satin-smooth paint finish on this die casting. First the part is cleaned, then it is given a primer coat and dried. The proper number of finish coats are alternately applied and dried to complete the paint job. A few finished parts may be seen in the lower foreground. The parts meeting final inspection are then sent on to packaging.

PACKAGING FOR THE CUSTOMER . . . Here again, great care is taken to avoid the possibility of nicks and scratches. The corrugated cardboard boxes are set up by hand as is shown in the case for small parts. The large castings are being packed four to a box. The size of a package is limited by the shape of the part, the overall bulk of the box, and the total weight of the box and contents. These considerations are a direct result of the fact that the packages will eventually be manually transported.

THIS IS DIE CASTING. The details of its nature and operation as presented here touch only lightly on the more general aspects of die casting. The more specific and highly technical details will be left to future articles which will deal with solutions to technical problems arising in any one of the general areas of die casting mentioned.

To give an overall picture of the die casting process we have offered two separate stories. The first, in pictures, describes the complete production of a die cast part, demonstrating the relationship of the die casting operation to all other preparatory and finishing operations. The second, in words, presents a close-up view of the die casting operation itself. In dealing with the more technical aspects of casting metal under pressure in a steel die a differentiation is made between the hot chamber process and the cold chamber process. The operations of the die casting machine and the die casting die are also included for better understanding. The basic alloying metals used in die casting are touched upon to suggest both the limitations and opportunities die casting presents to the product designer.

■ ■ ■

Where are the . . .

Educational Opportunities

TWO QUESTIONS concerning the teaching of Die Casting Technology in our Colleges, Universities, and Technical Institutes have been raised. The first is, "What types of undergraduate and graduate courses are being taught that include the subject of die casting?" A direct result of the first question is the second, "What institutions offer courses in Die Casting Technology and where are their geographic locations?"

This article answers these questions by correlating the data received in our recent survey of 100 Colleges and Universities across the United States.

by John R. Zurbrick
Editor-in-Chief

QUESTIONS ASKED in our survey of Engineering Deans at the institutions listed were patterned to provide the necessary information with the least amount of effort. However, for those who wished to add the names of particular courses, subject details, or other comments, sufficient space was allowed.

1. Are you now offering courses listed as "Die Casting Technology" or by a similar title?
2. If so, under what Department?
3. Have you ever offered courses listed as "Die Casting Technology" or similarly?
4. If so, in what years? Under what Department?
5. Do you plan to offer courses listed as "Die Casting Technology" or similarly in the near future?
6. If so, how soon?

SIXTY-FIVE questionnaires were returned and of those 61 were answered "no" throughout. Of the 61, valuable additional comments were returned with 28. Of the four remaining, one was answered "yes" to question 1, one was answered "yes" to question 3, and two were answered "yes" and "possible" to question 5.

The most frequent comment added to the questionnaire was that the die casting subject was fairly well covered from a lecture standpoint in the first shop course, usually entitled "Manufacturing Processes." This course was either offered by the Mechanical Engineering Department or the Industrial Engineering Department. A more careful study of the various die casting alloys was frequently mentioned to be offered in a variety of courses given by the Metallurgical Engineering Department. It was indicated that a fair amount of time was spent in discussing the die casting process in these lecture courses, two to three lecture periods being devoted to it in the introductory shop course alone.

(Concluded on Page 20)

THESE UNIVERSITIES, COLLEGES, AND INSTITUTES PARTICIPATED IN THE SURVEY

*Univ. of Alabama, University, Ala.
Alabama Poly. Inst., Auburn, Ala.
*Univ. of Arizona, Tucson, Ariz.
*Univ. of Arkansas, Fayetteville, Ark.
Poly. Inst. of Brooklyn, Brooklyn, N.Y.
*Brown University, Providence, R.I.
*Bucknell Univ., Lewisburg, Pa.
Univ. of California, Berkeley, Calif.
*U.C.L.A., Los Angeles, Calif.
*Univ. of South. Calif., Los Angeles
Calif. Inst. of Tech., Pasadena, Calif.
*Carnegie Inst. of Tech., Pittsburgh, Pa.
*Case Inst. of Tech., Cleveland, Ohio
*Univ. of Cincinnati, Cincinnati, Ohio
*Clarkson College of Tech., Potsdam, N.Y.
*Clemson College, Clemson, S.C.
*Univ. of Colorado, Boulder, Colo.
Colorado School of Mines, Golden, Colo.
*Columbia University, New York, N.Y.
*Univ. of Connecticut, Storrs, Conn.
*Cooper Union, New York, N.Y.
*Cornell University, Ithaca, N.Y.
Univ. of Delaware, Newark, Del.
Univ. of Denver, Denver, Colo.
Univ. of Detroit, Detroit, Mich.
Drexel Inst. of Tech., Philadelphia, Pa.
*Duke University, Durham, N.C.
*Fenn College, Cleveland, Ohio
*Georgia Inst. of Tech., Atlanta, Ga.
Howard University, Washington, D.C.
*Univ. of Illinois, Urbana, Ill.
*Illinois Inst. of Tech., Chicago, Ill.
*Iowa State College, Ames, Iowa
*State Univ. of Iowa, Iowa City, Iowa
*Johns Hopkins Univ., Baltimore, Md.
*Univ. of Kansas, Lawrence, Kan.
*Univ. of Kentucky, Lexington, Ky.
*Lafayette College, Easton, Pa.
Lehigh University, Bethlehem, Pa.
*Louisiana State Univ., Baton Rouge, La.
*Louisiana Poly. Inst., Ruston, La.
*Univ. of Maine, Orono, Me.
*Marquette University, Milwaukee, Wis.
*Univ. of Maryland, College Park, Md.
*Univ. of Massachusetts, Amherst, Mass.
Massachusetts Inst. of Tech., Cambridge, Mass.
University of Michigan, Ann Arbor, Mich.
*Michigan State Univ., E. Lansing, Mich.
*Mich. Coll. of Mining & Tech., Houghton, Mich.
Univ. of Minnesota, Minneapolis, Minn.
*Mississippi State Coll., State College, Miss.
Univ. of Missouri, Columbia, Mo.
*Missouri School of Mines, Rolla, Mo.
Montana State Coll., Bozeman, Mont.
*Univ. of New Hampshire, Durham, N.H.
*Newark Coll. of Eng'g., Newark, N.J.
*Coll. of the City of New York, New York, N.Y.
*New York University, New York, N.Y.
*North Carolina State Coll., Raleigh, N.C.
North Dakota Agric. Coll., Fargo, N.D.
Northeastern University, Boston, Mass.
*Northwestern Tech. Inst., Evanston, Ill.
Ohio State Univ., Columbus, Ohio
*Ohio University, Athens, Ohio
*Univ. of Oklahoma, Norman, Okla.
Oregon Agric. College, Cornwallis, Ore.
Univ. of Pennsylvania, Philadelphia, Pa.
*Pennsylvania State Univ., State College, Pa.
Pratt Institute, Brooklyn, N.Y.
*Purdue University, W. Lafayette, Ind.
*Rensselaer Poly. Inst., Troy, N.Y.
*Univ. of Rhode Island, Kingston, R.I.
Rice Institute, Houston, Texas
*Univ. of Rochester, Rochester, N.Y.
*Rose Poly. Inst., Terre Haute, Ind.
*Rutgers University, New Brunswick, N.J.
*Univ. of Santa Clara, San Jose, Calif.
*Stanford University, Stanford, Calif.
*Stevens Inst. of Tech., Hoboken, N.J.
Syracuse University, Syracuse, N.Y.
Univ. of Tennessee, Knoxville, Tenn.
*Univ. of Texas, Austin, Texas
*Texas Tech. College, Lubbock, Texas
*Texas A & M, College Station, Texas
University of Toledo, Toledo, Ohio
Tulane University, New Orleans, La.
*Tufts University, Medford, Mass.
Univ. of Utah, Salt Lake City, Utah
Vanderbilt University, Nashville, Tenn.
*Univ. of Virginia, Charlottesville, Va.
*Virginia Poly. Inst., Blacksburg, Va.
*Washington University, St. Louis, Mo.
Univ. of Washington, Seattle, Wash.
State Coll. of Washington, Pullman, Wash.
Wayne State Univ., Detroit, Mich.
*West Virginia Univ., Morgantown, W.Va.
*Univ. of Wisconsin, Madison, Wis.
Worcester Poly. Inst., Worcester, Mass.
*Yale University, New Haven, Conn.

* Returned Questionnaire.

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Lightweight metals for heavy weight jobs. That's the trend!

Progressive new developments . . . advanced techniques in the field of light alloy tooling have greatly increased the range of parts capable of being produced by die casting and permanent mold methods. Many new design concepts are possible, as a result, providing the designer with the opportunity of introducing unique and practical advantages into the product—advantages obtainable in no other way.

PMD has worked cooperatively with many leading companies to enlarge the scope of light alloy fabrication, and has pioneered many of the significant developments in this field. One of America's largest independent producers of light alloy tooling, PMD's facilities are extensive and exceptionally complete. The men . . . machines . . . the engineering know-how—plus an experience-record of proved performance!

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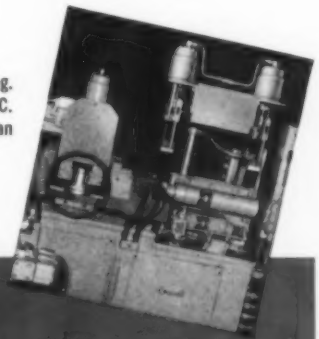
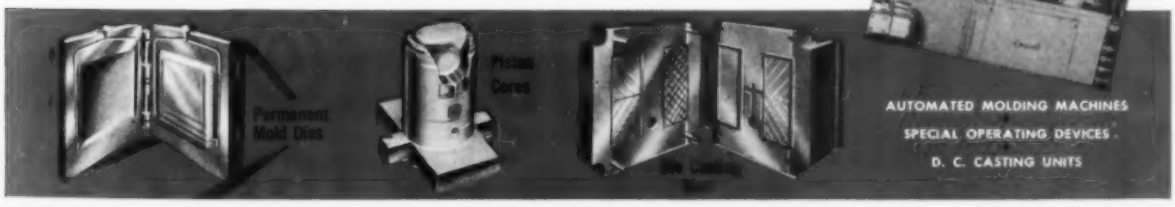
2277 East 9 Mile Road — Hazel Park, Michigan
SLocum 7-8100 (Detroit)



Complete Design, Engineering, Technical Services Available



REED VACUCAST gives Cleveland Hardware DENSER

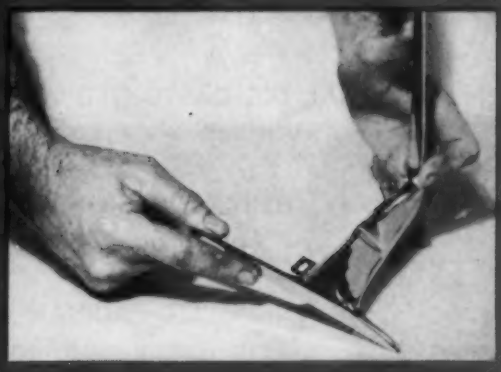
Cleveland Hardware Attributes Order For Portable TV Set Masks Directly To REED Vacucast System

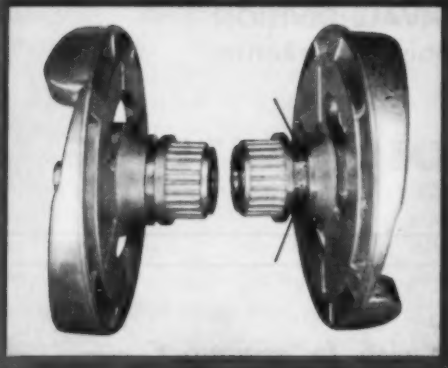
"As a result of being able to reduce wall thickness to .050 of an inch in the zinc casting for a portable TV set mask, we have received a large order," says H. E. White, President of Cleveland Hardware & Forging Company. "This mask could not have been done on a conventional die caster, but with our REED Vacucast machine, we can cast this thin-walled part despite its large area." Cleveland Hardware has also found faster cycles and a vast improvement in the quality of all castings produced on their REED Vacucast.

The REED Vacucast, a vacuum die casting system offered exclusively by Reed-Prentice as original equipment on standard machines, has proven itself in a number of standard production shops. Cleveland Hardware & Forging Company is the latest to find these many advantages in the REED Vacucast:

- Cycling time is 25% faster on some jobs.
- Reject rates have been cut by more than 50% —in some instances 90%.

CASTINGS, IMPROVED FINISH





The photos above show the strength which the REED Vacucast gives to even the thinnest wall castings – flexible enough to bend, yet strong enough to withstand breaking.

Porosity was a problem (right) for Cleveland Hardware in die casting this zinc cam. Now, their REED Vacucast gives them dense castings, cuts reject rates (left).

- Surface finish has been improved, greatly reducing polishing and buffing.
- Less pressure is needed. Many find that a 400-ton machine can replace a conventional 600-ton machine.
- Permissible reduction in wall thickness has meant great savings in metal. Now competes favorably with metal stamping.
- Porosity has been virtually eliminated.
- Improved casting skin and higher density permits higher temperatures for better paint-to-part bond.
- As much as .02" greater skin thickness in thin castings is common.

These are just a few of the many advantages found in the REED Vacucast. To find out how a REED Vacucast can help solve many of the problems you now have in die casting with conventional equipment, mail the coupon here today to Reed-Prentice Corporation, 677 Cambridge Street, Worcester 4, Mass., or contact our nearest sales office.

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REED-PRENTICE CORP.
677 Cambridge Street
Worcester 4, Mass.

Please send me more information on REED Vacucast System as ☐ original equipment ☐ conversion units.

Name_____

Title_____

Company_____

Street_____

City_____ State_____

Casting Around

by THEODORA SIMONEAU

I HAVE WORKED for Western Alloyed Steel Casting Company just 7 weeks and 2 days, but in a lifetime of living I know of no other place where I could have learned more about a business and its people. There is no longer a Western Alloyed Steel Casting Company, and its people have gone to all points of the compass, but none will ever forget the shock that we received the morning of July 9, 1957, when we learned of the death of Mr. Heywood.

Mr. Heywood started with the company in 1923 as an accountant and auditor. In a few years he rose to treasurer and finally partnership. In 1953 he bought out his partner, becoming president and sole owner of the company.

Mr. Heywood, though knowing he had an extremely weak heart, was no 8 hour a day man on the job. I have known him to sleep on a cot at the office or roam around in the foundry at night, talking with the men, asking questions, and if not satisfied, ask more questions until he had the answer, though the answer did not come easily.

He was not a member of the S. D. C. E., but had shown great interest in it and its purpose. He had recently questioned me about its aims and how his and my own membership might be beneficial to the company. I regret that he did not have the opportunity to join our group, for he would have been an interested and active member. ■ ■ ■

EDUCATIONAL OPPORTUNITIES

(Concluded from Page 14)

Foundry practice at the undergraduate level was commented on by only three Institutions. Those comments were as follows:

James L. Leach, Foundry Laboratory, U. of Illinois, Urbana.

"In our Material Casting Classes we devote considerable time to Die Casting and Permanent Mold Work. Also Lost Wax, Slush, Centrifugal (Casting), etc."

Paul G. Hausman, School of Engineering and Architecture, U. of Kansas, Lawrence.

"We include die casting technology in two of our foundry courses, 'Foundry Technology I' and 'Foundry Technology II'. We have two die casting machines in our laboratory."

R. J. Owens, Dean of Engineering, Illinois Institute of Technology, Chicago.

"When we offered (1948, Met. Eng'g.) the course we had less than 5 students—even our general foundry courses barely get enough students (6 to 7) to make them worthwhile."

Apparently there is an extreme lack of course work in die casting technology that may be obtained at our colleges and universities. A surprising number of Deans and Professors made comments explaining their views on why more die casting courses are not being taught.

William Hazell, Dean, Newark College of Engineering, Newark, N.J., states, "This is close to the 'art' of engineering, requiring specialization that cannot be taught in undergraduate curricula. If there is sufficient demand, we could offer such courses in our Special Courses or Graduate Division."

R. E. Vivian, Dean, University of Southern California, Los Angeles, captures the thought with, "Depends on demand."

R. Schulman, Jr., Chem. and Met. Engineering, Purdue University, W. Lafayette, Indiana, has the view that, "Die Casting is too specialized to form the basis of a University course."

R. G. Paddock, Prof. of Mech. Engineering, University of Arkansas, Fayetteville, agrees with, "This (die casting) is too specialized a field to warrant offering a separate course."

Demand seems to be the key word, and that demand comes only from the students themselves that would be interested in taking further lecture and laboratory courses in die casting. The Colleges and Universities at which such advanced courses are offered today are few and far between. To interest students in the Die Casting Industry through student membership is only one of the many goals of the Society of Die Casting Engineers. ■ ■ ■

Chapter News

1 DETROIT and 2 SAGINAW VALLEY

Secretary-Treasurer: Ollie Clayton
Permanent Mold & Die
Hazel Park, Michigan

COORDINATION OF PRODUCT DESIGN, TOOL DESIGN, AND PRODUCTION was the topic of a talk by Harry Erickson, president of The Society of Die Casting Engineers, at the September 10th joint meeting of the Detroit and Saginaw Valley Chapters. Because of his background as Plant Manager of the Chrysler Corporation Die Casting Plant in Kokomo, Indiana, Mr. Erickson triggered a very lively and informative discussion among those present.

The October 1st meeting will feature a talk by Erwin Lubalin, General Manager of Shaw Process Development Corporation. His speech is entitled "Precision Casting of 5% Chromium Die Steels for the Die Casting Industry." This is a new development for producing cavities and cores which are cast to size and finish.

3 WESTERN MICHIGAN

Secretary-Treasurer: Leslie W. Haisen,
Vickers, Inc.

Western Michigan scheduled no September meeting, but the ensuing meetings are to be held at the famous German restaurant, The Schnetzelbank.

Speakers for the year have been contacted, but since all the acceptances have not been received, no schedule is available at this writing.

During the summer the by-laws were changed to provide for election of officers so that terms become effective June 1st instead of January 1st.

The Chapter has designed a new booklet-type announcement for this year which includes advertisements. They already have a number of confirmed subscribers.

4 TOLEDO

Secretary-Treasurer: T. E. Hansen
E. F. Houghton & Co.

No report.

5 CHICAGO

Secretary-Treasurer: Robert A. Wunderlich
Mid-Western Die Casting Co.

No report.

6 CLEVELAND

Secretary-Treasurer: Robert D. Black
The Rex Oil & Chemical Co.

The new season for the Cleveland Chapter will open with a clam bake on October 5th.

Outstanding speakers have been lined up for the Fall, Winter and early Spring meetings.

Alfred F. Bremble, Chairman of the Membership Committee, may be reached at the Aluminum Smelting and Refining Co., Inc., 5463 Dunham Road, Bedford, Ohio.

7 NEW YORK

Acting Secretary: Theodore J. Kerekas

Mr. Harris R. Shimel, First National President of the Society of Die Casting Engineers, was present at the September 19th meeting of the New York Chapter at the Hotel Governor Clinton.

Election of officers took place. We will publish the results in our next issue.

10 ONTARIO

The first meeting of our Canadian chapter will be held on Thursday, October 24th, at the Brass Rail's Convention Room in London, Ontario. Installation of officers will take place.

Foster C. Bennett of the Dow Chemical Company will attend the meeting and present a paper which will deal with a subject of interest to the membership.

18 NEW ENGLAND

Acting Secretary: Milton Harmon

No news to report.

PEOPLE IN DIE CASTING

Walter R. Anyan dies, Samuel Riker, Jr. succeeds him

Walter R. Anyan, Secretary of The New Jersey Zinc Company, died on July 25th at the Greenwich, Connecticut, Hospital. He was 60 years of age.

Mr. Anyan started his employment with the Company in 1915 and progressed through the organization to become Secretary in 1948. He was a graduate of Polytechnic Institute of Brooklyn.

Samuel Riker, Jr. has been elected Secretary of The New Jersey Zinc Company, to fill the vacancy left by the death of Mr. Anyan. Mr. Riker has been Treasurer of the Company for several years, and he will retain that office, also.

Douglas Eaton appointed Sales Manager

Douglas G. Eaton has been appointed Sales Manager of Vacuum Die Casting for Reed-Prentice Corporation, Worcester, Mass., manufacturers of die casting machines. Mr. Eaton will be responsible for promoting sales of Reed-Prentice vacuum die casting equipment on a national basis. His headquarters will remain in Cleveland.

For the past eight years, Mr. Eaton has been district manager for Reed-Prentice in the Cleveland territory. In his new position, he will work with Reed-Prentice sales engineers throughout the country.

Joseph Zemianek Named Sales Engineer

Joseph P. Zemianek has been named Sales Engineer in Reed-Prentice's Cleveland office to handle sales of Reed die casting and injection molding machines in the Cleveland area.

Mr. Zemianek has been with Reed-Prentice for 16 years, most recently working as service engineer for the Cleveland, Dayton and Buffalo branch offices.

Rost Joins Franklin Oil

The Franklin Oil & Gas Company, 34-40 South Park Street, Bedford, Ohio has announced that **Edward J. Rost** has joined their sales force as lubrication engineer.

Rost has been associated with the oil industry in a sales capacity for the past seven years. In his new position he will continue to call on industrial concerns in the Northeastern Ohio area. Rost has been active in the American Society of Lubrication Engineers and has just completed his term as Chairman of the Cleveland Chapter. He is also serving on the convention committee of this organization. The company recently announced the development of a new type fire-retardant hydraulic fluid.

PEOPLE IN DIE CASTING

Frank D. Brittain

Hoover Ball & Bearing Announces Promotions

Hoover Ball and Bearing Company of Ann Arbor announces the following promotions. **Frank D. Brittain** becomes Vice-President in charge of sales for all die casting operations. **Eugene Carpenteir** has been appointed Chief Engineer of all Hoover Die Casting Divisions. **Howard Russ** takes over as Director of Purchases for all Die Casting Divisions, and **Alfred F. Duttweiler, Jr.** has been named Plant Manager of the Universal Die-Casting Division, located in Saline, Michigan.

Brittain, formerly Sales Manager of the Automotive division of Universal Die Casting, has been with Hoover for 7 years. He was a general foreman of production with the Ford Motor Company prior to joining Hoover's Universal division.

Carpenteir, a graduate of Ford Trade School, was formerly Chief Engineer of the Universal Die Casting Division. He has been with Universal for six years.

Russ, a veteran of many years in the Die Casting Industry, has been associated with Universal for the past twelve years. He was formerly Purchasing Director of Universal.

Duttweiler has been employed at Universal since graduating in Chemical Engineering from the University of Michigan nine years ago.

M. J. Markowski Directs Mark-Shaw Expansion

M. J. Markowski has resumed full time activity with The Mark-Shaw Corporation of Cleveland, Ohio.

He is directing both their engineering work and the formation of a new company which is now in a position to supply die castings. Anyone interested in their engineering services or die castings can obtain further information by contacting:

The Mark-Shaw Corporation
18206 Windward Road
Cleveland 19, Ohio

Stanley B. Knapp Company To Represent Bohn In South

R. C. Aylward, General Sales Manager of Bohn Aluminum & Brass Corporation, Detroit, announces the appointment of the **Stanley B. Knapp Company,** 3252 Peachtree Road, N.E., Atlanta, Georgia, to represent Bohn in a seven-state Southern Area including Tennessee, Mississippi, Alabama, Georgia, South Carolina, North Carolina and Florida, for the sale of the complete line of Bohn products.

Bohn operates 10 plants in Michigan, Indiana and Illinois, manufacturing aluminum and brass extrusions and forgings, aluminum castings, brass rod and shapes, brass and bronze ingot, bearings and pistons and refrigeration and air conditioning products.

Upton Bradeen & James, Ltd. Represent B&T In Canada

B&T Machinery Company of Holland, Michigan announce the recent appointment of Upton Bradeen & James, Ltd. of Toronto, as their exclusive representatives in Canada. The B&T die-casting machines for zinc and aluminum are built in sizes from 100 to 800 tons of clamping pressure.

ADVERTISERS INDEX

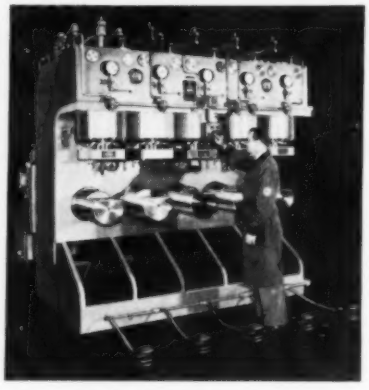
NEWS of the INDUSTRY

HOOVER BALL & BEARING COMPANY BREAKS GROUND FOR NEW PLANT

Hoover Ball & Bearing Company executives attending ground-breaking ceremonies for their new million and half dollar plant for the ball and bearing division in Ann Arbor, Michigan, are from left to right—

Everett Esch, Vice President; Frank Brittain, Vice President; Robert Ressler, Vice President; H. L. Schrock, Jr., Vice President and General Manager of the Ball Bearing division; William L. Brittain, Executive Vice President; Clifford H. Simmons, Chairman of the Board and President; William K. Meister, Vice President; William Lighthall, Factory Manager of the Ball & Bearing division; Walter Kraus, Secretary.

H-P-M FIVE STATION OPEN GAP HORN PRESS AVAILABLE



This H-P-M five-station open gap horn press, built by The Hydraulic Press Mfg. Co., a Division of Kochring Co., Mount Gilead, Ohio, was designed for punching and embossing operations formerly requiring several presses. One compact welded steel frame houses five main cylinder and ram assemblies which are controlled individually by foot pedal at the option of the operator who is doing the work originally handled by several.

Each of the five main rams has a pressure capacity of 100 tons. The tonnage range for each ram is adjustable from 100 tons to a minimum of 4 tons. Maximum daylight between ram adaptor and horn is 12″; each ram has a 6″ stroke.

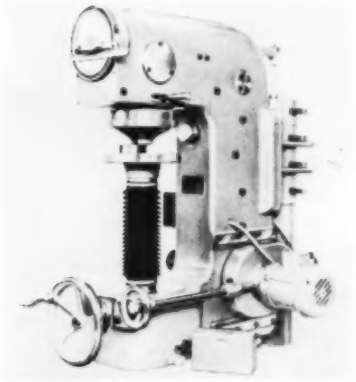
The diameter at the base of each horn is 11″. The length of the horn from the throat is 20″. From the throat to the centerline of the ram is 15″.

The entire unit is powered by a 50 H.P. electric motor and a 100 gallon H-P-M radial type piston pump.

INDUSTRY

Gries Displays New Optical Projection Hardness Testers At National Metal Show

At the National Metal Exposition & Congress in Chicago—November 4th through 8th—the Testing Machines Division of Gries Industries, Inc., New Rochelle, N.Y., will display and demonstrate several of the most modern, accurate, and versatile hardness testing devices currently available. Many of these operate on the "Reflex" principle; they include a specially developed Carl Zeiss optical system, which produces and automatically projects a greatly magnified image of the test indentation. No tedious, separate microscopic measurement is necessary.



Motorized "Reflex" model for high-speed hardness determination. In production, adjustable limit stops quickly tell operator if size of indentation is within tolerances, allowing tester to function like go/no-go gage.

Joseph Fox has resigned as Technical Consultant with the American Die Casting Institute. He is a member of the SDCE.

INDUSTRY

Die Steels Cataloged

Disdie Steel, Inc., 21066 Ryan Road, Warren, Michigan (Detroit), announces that it has all sizes of pre-tempered and hot work steels in stock. Die blocks—rough machined or matched and ground square and parallel—can be delivered directly from its Warren, Michigan (Detroit) warehouse in sizes up to 12" x 36" x 100".

They include (1) "Disdie" – a pretempered, ultra-sonic tested, tool steel for die casting dies, (2) "H-13" – vanadium, hot work die steels for die casting inserts and extrusion tools, and (3) "Caldie"—electric furnace alloy steel for plastic and metal die casting dies.

Die blocks are color coded for customer convenience; "Disdie" – blue, "H-13" – red and "Caldie" – yellow.

SDCE ELECTIONS

NOMINATION OF CANDIDATES for the forthcoming SDCE National Elections are now being accepted.

Each local Chapter has been asked to submit to the National Nominating Committee a list of its candidates by October 31st.

The Executive President, Executive Vice-president, and a three-year Director will be chosen in the January election. Two or more candidates will be running for these offices. All must be SDCE members in good standing.

Each candidate must submit a letter to the Nominations Committee confirming his acceptance of the nomination.

Be on the look-out for capable men to fill these important positions.

SDCE SUSTAINING MEMBERS

American Mold Engineering Co.
Charlevoix, Michigan

Atols Tool & Mold Corp.
Chicago 39, Ill.

Congress Die Casting Div.: The Tann Corp.
Detroit 34, Michigan

Crucible Steel Corp.
Syracuse, New York

General Motors Corp.
Detroit 2, Michigan

Experimental Tool & Die Co., Inc.
Detroit 5, Michigan

The Hydraulic Press Mfg. Co.
Mount Gilead, Ohio

Latrobe Steel Co.
Latrobe, Penn.

Lester Engineering Co.
Cleveland 13, Ohio

Mergraf Oil Products Co., Inc.
Northville, Michigan

Moldcraft Engineering Co.
Hazel Park, Michigan

Permanent Mold & Die Co., Inc.
Hazel Park, Michigan

Prospect Die & Mold, Inc.
Center Line, Michigan

Universal Die Casting Div.:
Hoover Ball & Bearing Co.
Saline, Michigan

CURRENT SDCE MEMBERSHIP RATES

DUE TO RAPID expansion and rising costs, SDCE Membership rates have been increased, effective May 25, 1957.

Here are the present rates:

Initiation and Application Fee*	$ 5.00
*Active Membership	$ 15.00
*Member-at-Large	$ 15.00
Member of Sustaining Company	$ 12.50
Student Member	$ 5.00
Sustaining Membership†	$150.00
Company Membership†	$ 50.00

* Applicable to indicated classifications. Must be submitted with payment of *new* membership dues.

† Minimum.

Sustaining-Member Contest Announced

TAPE RECORDER OFFERED TO WINNING SDCE CHAPTER! The National Offices of the Society of Die Casting Engineers announces its "Sustaining-Member Contest." Your local SDCE Chapter will win a handsome tape recorder if it takes in the largest number of *new* Sustaining Members between Tuesday, October 1, 1957 and Saturday, February 15, 1958.

The efforts of every member is necessary to bring your Chapter out on top. Bring 'em in!

FOR THESE ZINC CASTINGS

at Stroh Die Casting Company

"YOU CAN'T BEAT THE 100 TON LESTER"

George Meier, General Manager of Stroh Die Casting Company, says:

> "For steady, dependable production on these die castings you can't beat the little 100 Ton Lester. Not only did we have a low initial investment, but maintenance costs have been surprisingly low during the entire eight years we've been using them."

The HHP-2-ZE includes among its features the famous Lester "one-adjustment" Zinc End and Central Die Height Adjustment. If you want to learn more about this rugged machine that can cast up to 6 pounds of zinc or make from 400 to 500 shots per hour, write today for Bulletin 101.

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DIE CASTING ENGINEER

OFFICIAL PUBLICATION OF
THE SOCIETY OF DIE CASTING ENGINEERS, INC.

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19370 James Couzens Hwy.
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THERMOLD AV

Die Casting Die Steel

Thermold AV

UNIVERSAL-CYCLOPS STEEL CORPORATION

Betty — the Martin girl says . . .

Martin solves production bottlenecks . . .

MARTIN

gets specified die-cast components to you in quickest possible time!

Whatever the size of your order, there s no waste time or motion at Martin. Why? Because each year our Cost Analysis Engineers spend hundreds of man-hours further streamlining our already-streamlined production facilities. This means quick-as-a-wink service for YOU. Streamlining production not only means faster delivery, but lower costs, which are immediately passed on to you.

And . . . "one roof responsibility" plus the most modern equipment made mean you get the *best*—whether you order one part or one-hundred. We meet your *exact* needs to micro-dimensional tolerances. From drawing board to finished product, our integrated facilities and skilled craftsmen with 5,000 years of cumulative experience are *at your complete disposal.*

Shown above are representative sleeves which we produce

We believe we have the finest facilities in the industry for manufacturing such precision die-casting components as: COLD SHOT SLEEVES . . . ADAPTER BUSHINGS . . . FEED CHAMBERS . . . PLUNGER TIPS . . . AND GOOSENECK SLEEVES.

DROP US A PRINT AND WE WILL SEND YOU OUR QUOTE BY RETURN MAIL

Note: Some standard sizes of sleeves and tips available immediately from stock.

Martin grinding and machine works, inc.

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